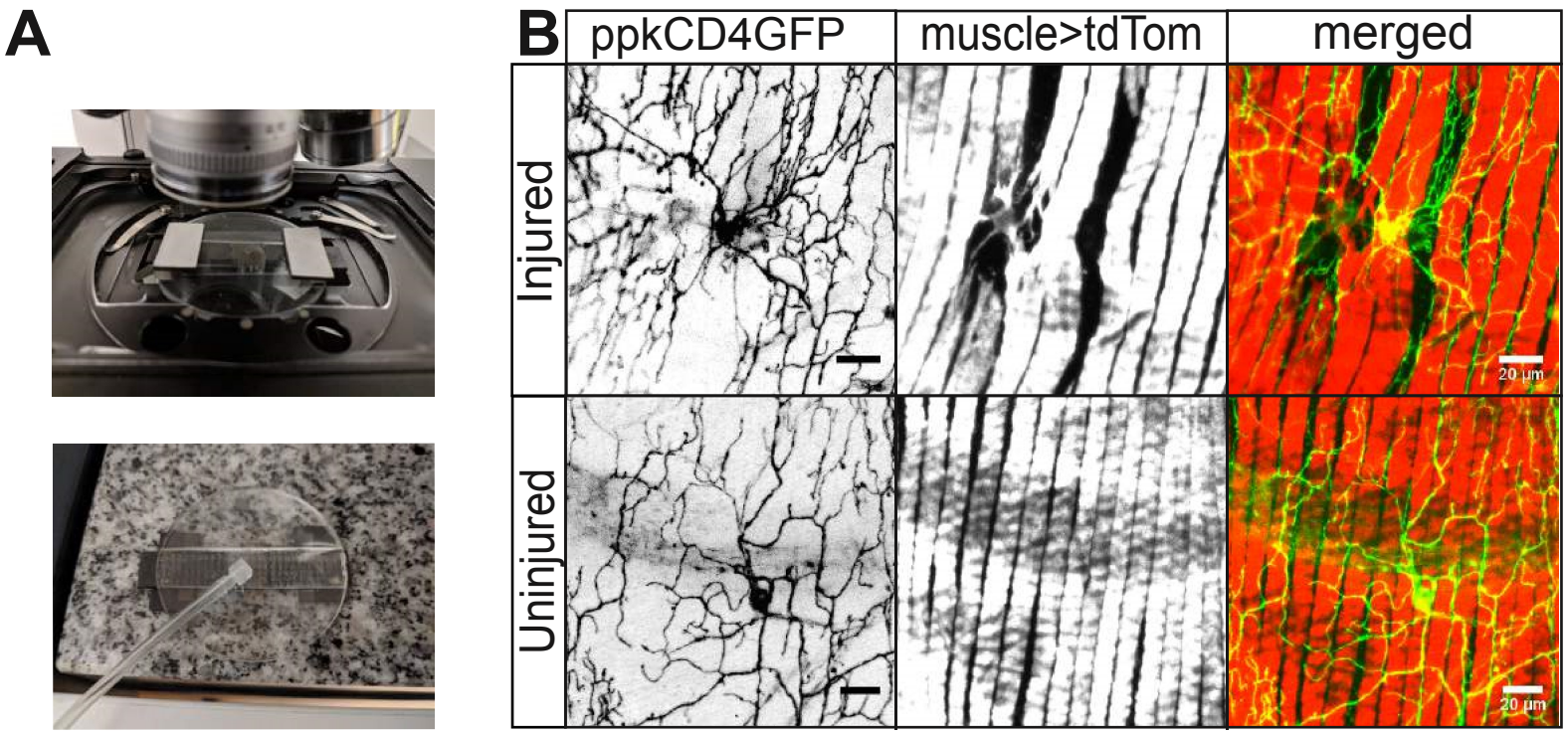
Supplemental Figure Legend

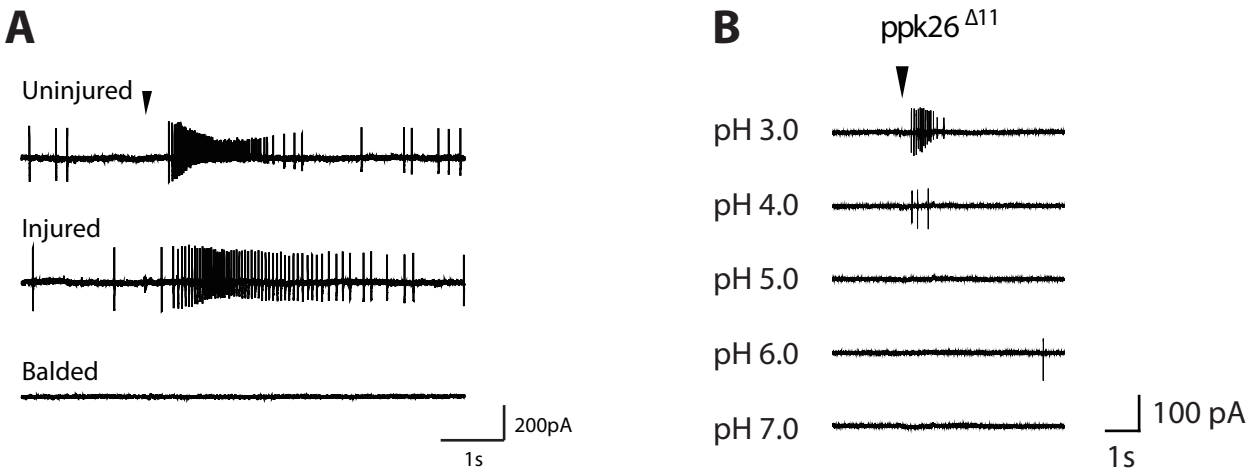
Supplemental Figure S1. A. Images of disc for repeated imaging in adult Drosophila. Disc is shown under a microscope. Underside of disc with connection to CO2 is shown. B. Muscle damage occurred during dendrite injury. Neurons are marked by ppkCD4tdGFP. Expression of UAS-tdTomato by Muscle Gal 4 (Mef2) marks the lateral abdominal muscles. Injury and degeneration is noted near location of scanning laser injury. C. Status of neighboring neurons does not effect dendrite regeneration. D. Dendrite coverage is not effected by status of neighboring neurons. Dendrite coverage was subject to a t-test. There was not a significant difference between regenerating neurons with injured neighbors (M=0.4490, SD=0.0841) and regenerating neurons with intact neighbors (M=0.3834, SD=0.0870) $t(10) = 1.329$, $p=0.2135$. E. Dendrite length of regenerating neurons was not effected by the status of neighboring neurons. Dendrite length was subject to a t-test. There was not a significant difference between regenerating neurons with injured neighbors (M=3711, SD=834) and regenerating neurons with intact neurons (M=3911, SD=568) $t(10) = 0.4862$, $p= 0.6373$. $n = 6$ intact neighboring neurons, 6 injured neighboring neurons.

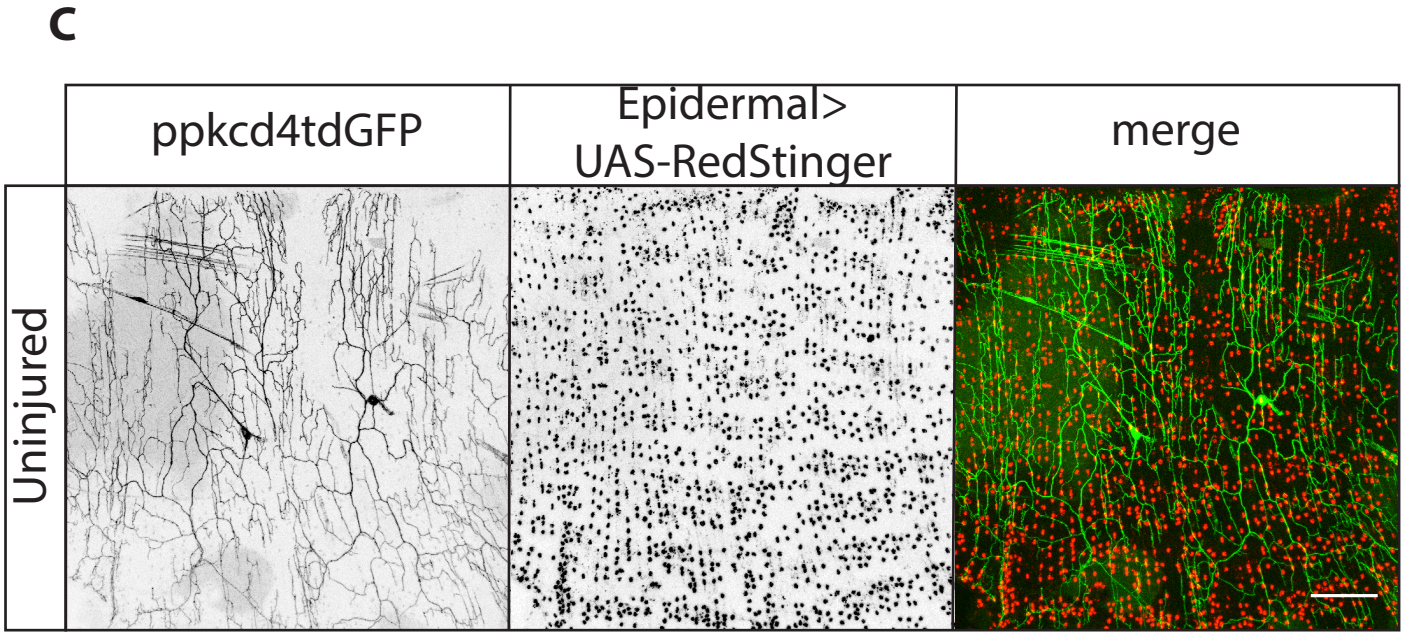
Supplemental Figure S2. A. Sample traces for response to acidified solution at pH=3. Balded neurons show no response to stimulation with acidified solution n=10. B. Ppk26 is not required for response to acid stimuli. Flies null for *ppk26*, $ppk26^{\Delta 11}/Df\ (3L)\ exel^{8104}$ responded to stimulation at pH=3. C. GMR51F10 Gal4 is expressed in the epidermis of the abdomen.

Supplemental Figure S3. Dendrite length of uninjured neurons at 8 days after eclosion. A. Knockdown of *mys* and *mew* decrease total dendrite length. Dendrite length was subject to a one-way ANOVA. There was a significant effect of integrin manipulation on dendrite length $F(3,14)$

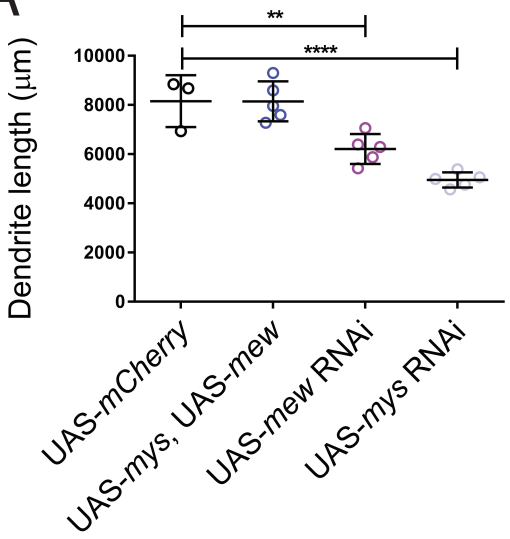
=23.07, p<0.0001. Tukey's posthoc test revealed that *mew* RNAi (M= 6211; SD=611) and *mys* RNAi (M=4957, SD=309) decreased dendrite length compared to *mCherry* expression (M= 8155; SD=1054) B. Mutants for *mmp2* ^{M100489}*/DF(2RBSC132* had increased dendritic length compared to wild-type neurons. Dendritic length was subject to a t-test. There was a significant difference between wild-type and *mmp2*^{MI00489}*/DF(2R)BSC132* neurons t (8) =6.150, p=0.0003. C. Epidermal knockdown of *mmp2* does not affect dendritic length in uninjured neurons. An unpaired t-test revealed no difference t (10) = 0.7839, p=0.4419. D. Neuronal knockdown of *mmp2* does not affect dendrite length in uninjured neurons. An unpaired t-test reveal no difference t (5) = 0.4433, p = 0.676. E. At 29º mutants for *mmp2*^{Y53N}*/DF(2R)BSC132* did not have increased dendritic length compared to wild-type neurons. An unpaired t-test revealed no difference between *mmp2*^{Y53N}*/DF(2R)BSC132* (M=11950, SD=1242) and wild-type neurons (M=12007, SD=899) t(8)=0.0833, p=0.9356.


A
B
ppkCD4GFP
muscle>tdTom
merged
Injured
Uninjured
20 µm
20 µm
C
+1D
+7D
Injured
Injured Neighbor
Intact Neighbor
D
Dendrite coverage normalized
ns
0.6
0.4
0.2
0.0
Inact
Injured
Status of Neighboring Neurons
E
Dendrite length (µm)
ns
6000
4000
2000
0
Inact
Injured
Status of Neighboring Neurons

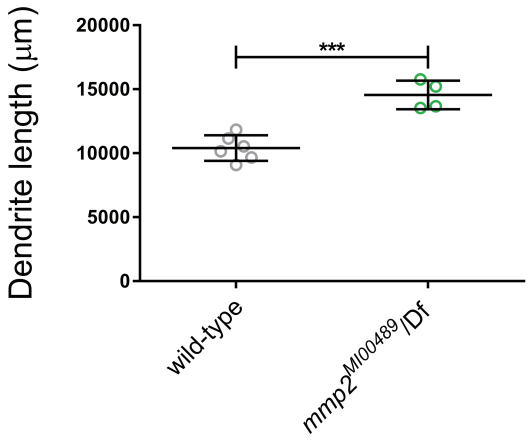

A
Uninjured
Injured
Balded
200pA
1s
B
ppk26 Δ11
pH 3.0
pH 4.0
pH 5.0
pH 6.0
pH 7.0
100 pA
1s


C
ppkcd4tdGFP
Epidermal>
UAS-RedStinger
merge
Uninjured

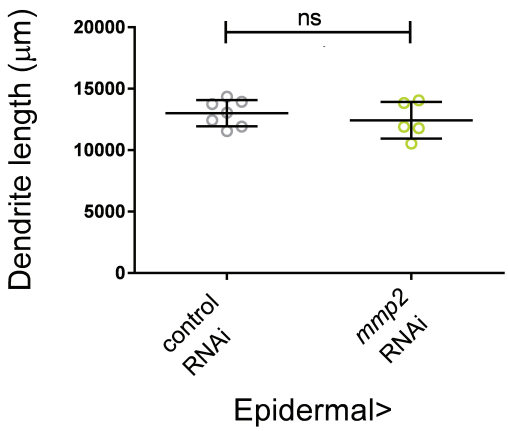
A


**
****
Dendrite length (µm)
10000
8000
6000
4000
2000
0
UAS-mCherry
UAS-mys, UAS-mew
UAS-mew RNAi
UAS-mys RNAi

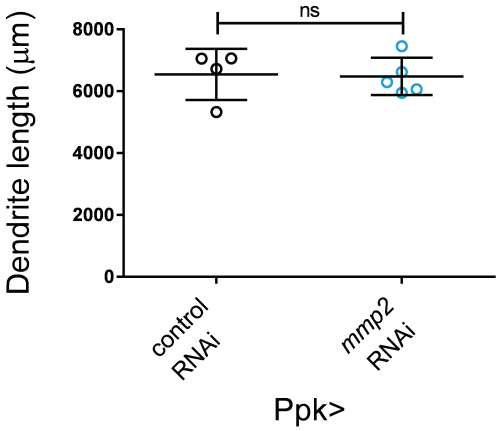
B


***
Dendrite length (µm)
20000
15000
10000
5000
0
wild-type
mmp2MI00489/Df

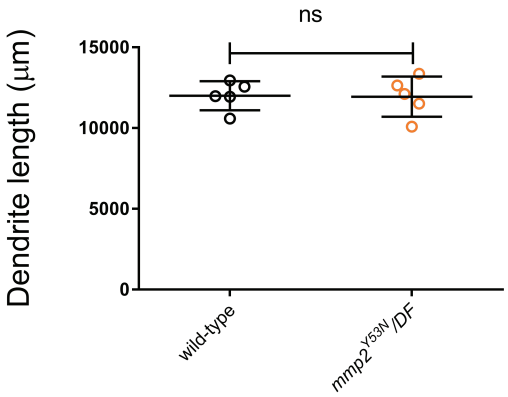
C


ns
Dendrite length (µm)
20000
15000
10000
5000
0
control RNAi
mmp2 RNAi
Epidermal>

D


ns
Dendrite length (µm)
8000
6000
4000
2000
0
control RNAi
mmp2 RNAi
Ppk>

E


ns
Dendrite length (µm)
15000
10000
5000
0
wild-type
mmp2Y53N/DF